

# Water Appliances Efficiency

Appliance Efficiency Rulemaking  
California Energy Commission

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# Agenda

- ❑ Pre-rulemaking
- ❑ Background
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  - ✓ Received proposals
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- ❑ Savings and cost analysis
  - ✓ Cost Effectiveness
  - ✓ Technically Feasible
- ❑ Impacts and Benefits
- ❑ Next Steps



# Pre-rulemaking

- ❑ **Order Instituting Rulemaking (3/14/12)**

Commission identified a variety of appliances with the potential to save energy and/or water for appliance efficiency measures.

- ❑ **Invitation to Participate (3/25/13)**

Opportunity for interested parties to inform the Commission about the product, market, and industry characteristics of the appliances identified in the OIR.

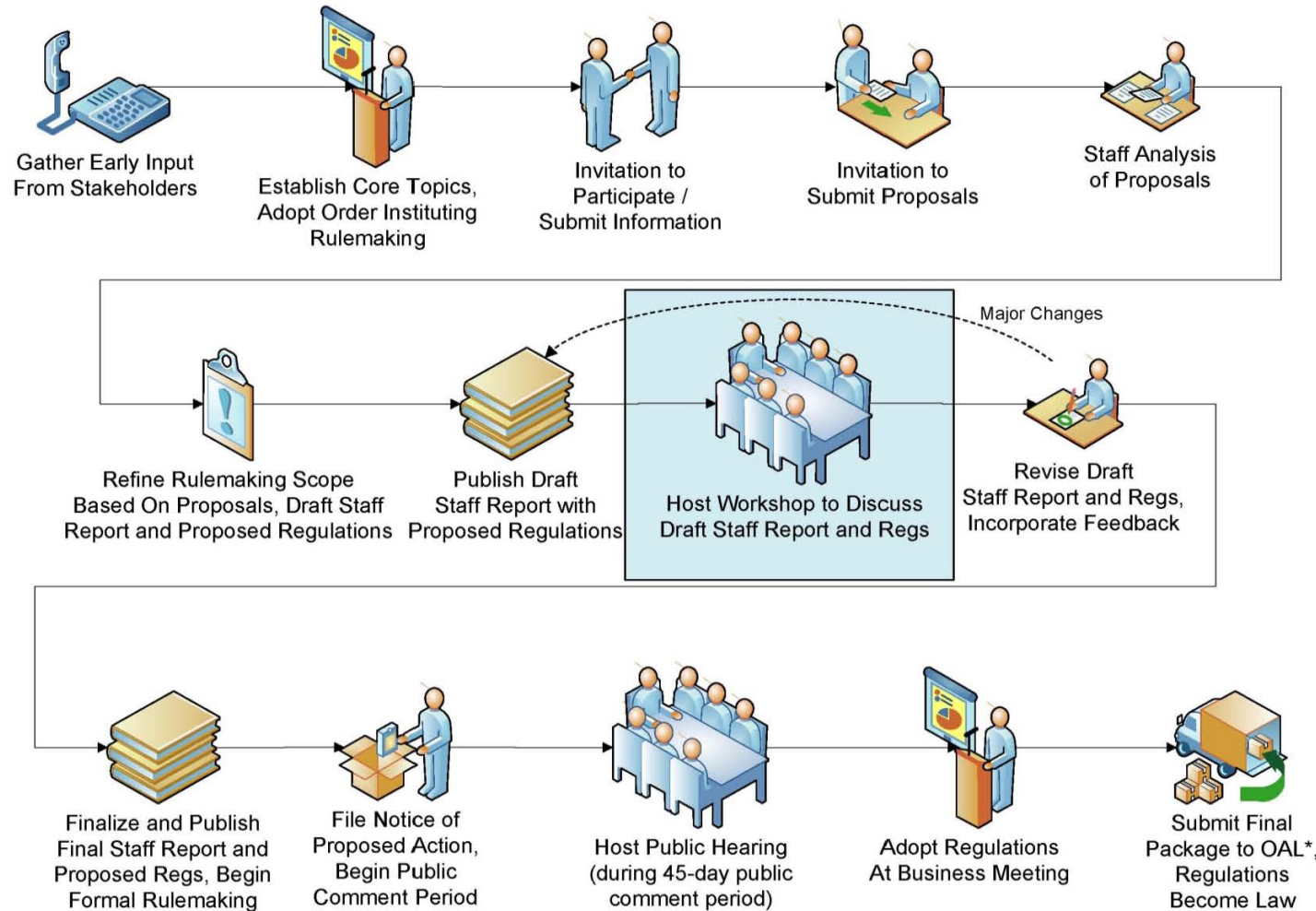
- ❑ **Invitation to Submit Proposals (6/13/13)**

Opportunity for interested parties to submit proposals for standards, test procedures, labeling requirements, and other measures to improve efficiency.



## Appliance Energy Efficiency Rulemaking Process

5/2/2013



\*Office of Administrative Law



# Why New Standards?

- ❑ We are in a drought.
- ❑ Reducing water consumption of toilets, urinals and faucets can save water and energy.
- ❑ What criteria were used to establish standard?
  - ✓ Technically feasible, and
  - ✓ Cost-effective.



# Staff Estimated Current Usage

	<b>Water</b> (MM g/yr)	<b>Embedded Electricity</b> (Gwh/yr)	<b>Hot Water Electricity</b> (GWh/yr)	<b>Hot Water Natural Gas</b> (MMTherms/yr)
<b>Residential toilets</b>	100,600	1,010	N/A	N/A
<b>Commercial toilets</b>	10,000	100	N/A	N/A
<b>Urinals</b>	4,200	40	N/A	N/A
<b>Residential lavatory faucets</b>	105,800	1,060	1,610	350
<b>Kitchen faucets</b>	201,100	2,020	3,050	660
<b>Public lavatory faucets</b>	22,100	220	N/A	70
<b>Totals</b>	<b>443,800</b>	<b>4,450</b>	<b>4,660</b>	<b>1,080</b>

Source: CASE reports and staff estimated



# Regulatory Settings

- ❑ Historical settings – CA Title 20
- ❑ Federal standards – EPA Act 1992
- ❑ AB 715 (2007) – SB 407 (2009)
- ❑ CalGreen 2013
- ❑ 2013 California Plumbing Code
- ❑ WaterSense



# Received Proposals

- ❑ California Investor-Owned Utility (IOU) and Natural Resources Defense Council (NRDC)
- ❑ Plumbing Manufacturer International (PMI)
- ❑ FluidMaster, Kohler, and Moen Inc.



# Staff Proposed Standards

By July 1, 2015

✓ Toilets: 1.28 gpf and a minimum  
MaP score of 350 grams

✓ Urinals: 0.5 gpf.

\*Blowout toilets and urinals from prisons and mental health facilities are exempt.

✓ Residential lavatory faucets: 1.5 gpm at 60 psi,  
and a minimum flow rate of 0.8 gpm at 20 psi,

✓ Residential kitchen faucets: 1.8 gpm  
optional temporary flow 2.2 gpm.

✓ Public lavatory faucets: 0.5 gpm.

By January 1, 2019

✓ Replacement valves for toilets: 1.6 gpf.

✓ Replacement valves for urinals: 1.0 gpf.



# First Year Savings

	<b>Water (MMgal)</b>	<b>Nat.Gas (MM-therm)</b>	<b>Energy<sup>b</sup> (GWh)</b>	<b>Savings (MM\$)</b>
<b>Residential toilets</b>	810	N/A	8	\$7
<b>Commercial toilets</b>	100	N/A	1	\$1
<b>Urinals</b>	130	N/A	1	\$1
<b>Residential lavatory faucets</b>	2,450	8	62	\$36
<b>Kitchen faucets</b>	3,290	11	83	\$49
<b>Public lavatory faucets</b>	1,420	6	14	\$17
<b>Total</b>	<b>8,200</b>	<b>25</b>	<b>169</b>	<b>\$111</b>

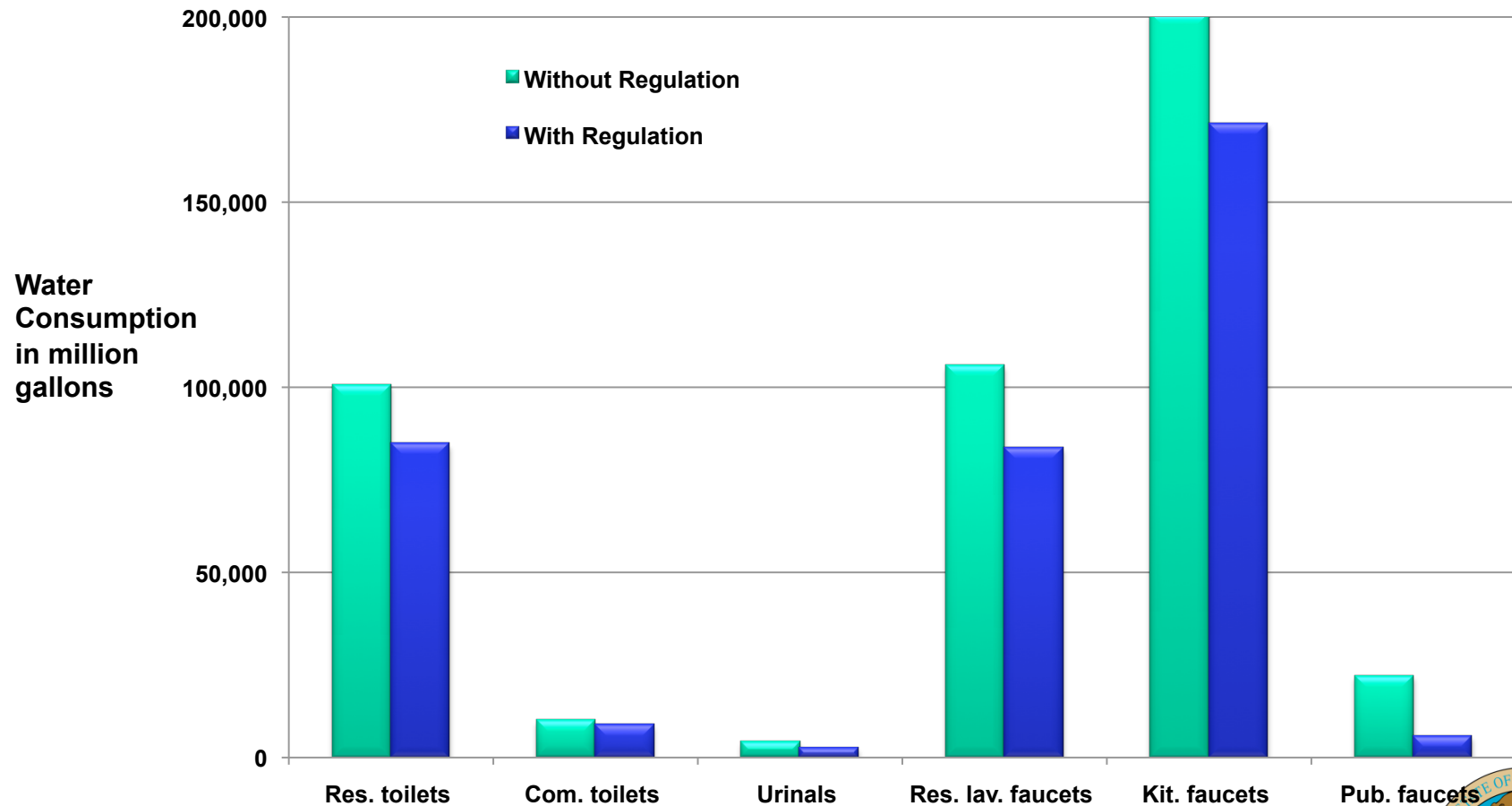


# Stock Change Savings

	<b>Water (MMgal)</b>	<b>Nat.Gas (MM-therm)</b>	<b>Energy<sup>b</sup> (GWh)</b>	<b>Savings (MM\$)</b>
<b>Residential toilets</b>	15,880	N/A	160	\$150
<b>Commercial toilets</b>	1,110	N/A	10	\$10
<b>Urinals</b>	1,550	N/A	20	\$10
<b>Residential lavatory faucets</b>	22,070	70	560	\$330
<b>Kitchen faucets</b>	29,700	100	750	\$440
<b>Public lavatory faucets</b>	16,280	50	160	\$190
<b>Total</b>	<b>86,590</b>	<b>220</b>	<b>1,660</b>	<b>\$1,130</b>



# Stock Water Savings



# Individual Appliance Savings

	<b>Design Life (years)</b>	<b>Incremental Cost (\$)</b>	<b>Average Annual Savings (\$)</b>	<b>Life Cycle Benefit (\$)</b>
<b>Residential Toilets</b>	25	0	\$1.82	\$45.5
<b>Commercial Toilets</b>	12	0	\$1.82	\$22.8
<b>Urinals</b>	12	0	\$10.07	\$121
<b>Residential Faucets</b>	10	0	\$7.21	\$72.1
<b>Kitchen Faucets</b>	10	0	\$18.28	\$183
<b>Public Faucets</b>	3	0	\$40.74	\$122



# Technical Feasibility

## ☐ Toilets and Urinals

- ✓ Better Gravity-Flush Tank-Type Toilets
- ✓ Redesigned Flush Valve
- ✓ Pressure-Assisted Flushometer Tank
- ✓ Flapperless Gravity Flush
- ✓ Vacuum-Assisted Toilet
- ✓ Dual-Flush Toilets

\*Maximum performance testing

## ☐ Faucets

- ✓ Smaller hole gaskets

The CEC and WaterSense databases show there are numerous models of compliant appliances available for sale is an indication that qualifying products are technically feasible and readily available in California.



# Impacts and Benefits

- No significant incremental impact to the environment

	Annual Reductions (tons)			Total Annual Reductions (tons)
	Toilets	Urinals	Faucets	
Oxides of nitrogen (NO <sub>x</sub> )	6.17	0.48	52.57	59.2
Sulfur dioxide (SO <sub>x</sub> )	0.88	0.07	7.51	8.46
Carbon monoxide (CO)	8.81	0.68	75.1	84.6
Particulate matter (PM <sub>2.5</sub> )	2.64	0.20	22.53	25.2
Greenhouse Gas (eCO <sub>2</sub> )	58,880	5,360	1,807,370	<b>1,871,610</b>



# Next Steps

- ❑ Consider input from workshop and public comments
- ❑ Revise staff report analysis and proposed requirements, as necessary
- ❑ Commission staff are available to discuss questions and concerns at anytime during the proceeding.



# Discussion & Comments

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